AMENDMENTS

Amendments to the Claims:

The following listing of claims will replace all previous listings and versions thereof:

1. (Currently amended) A method for isolating small RNA molecules from cells comprising:

   a) lysing the cells with a lysing solution to produce a lysate;
   b) adding an alcohol solution to the lysate to an alcohol concentration of about 35% to about 70%;
   c) applying the lysate to a solid support;
   d) eluting small RNA molecules from the solid support; and,
   e) using or characterizing the small RNA molecules.

2. (Previously presented) The method of claim 1, wherein the small RNA molecules include miRNA, siRNA, snRNA, snoRNA, tRNA molecules, or combinations thereof.

3. (Previously presented) The method of claim 2, wherein the small RNA molecules are miRNA molecules.

4. (Currently amended) The method of claim 1, wherein at least 20% of the small RNA molecules from the cells are isolated as compared to a standard RNA preparative procedure using organic extraction and ethanol precipitation using 4 volumes of ethanol.

5. (Currently amended) The method of claim 4, wherein at least 50% of the small RNA molecules from the cells are isolated as compared to a standard RNA preparative procedure using organic extraction and ethanol precipitation using 4 volumes of ethanol.

6. (Previously presented) The method of claim 1, wherein the lysing solution comprises a chaotropic agent or detergent.

7. (Previously presented) The method of claim 6, wherein the lysing solution comprises a chaotropic agent.

8. (Previously presented) The method of claim 7, wherein the concentration of the chaotropic agent in the lysing solution is at least about 2.0 M.

9. (Previously presented) The method of claim 7, wherein the lysing solution comprises guanidinium.

10. (Previously presented) The method of claim 9, wherein the concentration of guanidinium is at least about 2.0 M.

11. (Currently Amended) The method of claim 6 ~~10~~, wherein the lysing solution ~~further~~ comprises a detergent and a buffer.

12. (Previously presented) The method of claim 11, wherein the concentration of the detergent is about 0.1% to about 2%.

13. (Previously presented) The method of claim 12, wherein the detergent is N-lauroyl sarcosine.

14. (Previously presented) The method of claim 11, wherein the concentration of the buffer is about 10 mM to about 300 mM.

15. (Currently Amended) The method of claim 1, further comprising extracting small RNA molecules from the lysate with an extraction solution comprising an organic solvent after lysing and prior to adding an alcohol solution to ~~applying~~ the lysate ~~to the solid support~~.

16. (Previously presented) The method of claim 15, wherein the extraction solution comprises phenol.

17. (Previously presented) The method of claim 16, wherein the extraction solution further comprises chloroform.

18. (Canceled)

19. (Currently amended) The method of claim 1 ~~18~~, wherein the amount of alcohol solution added to the lysate makes the lysate about 50% to 60% alcohol.

20. (Currently amended) The method of claim [[18]]1, wherein the alcohol solution is added to the lysate before extraction with an organic solvent.

21. (Previously presented) The method of claim 1, further comprising washing the solid support with a first wash solution after applying the lysate to the solid support.

22. (Previously presented) The method of claim 21, wherein the first wash solution comprises a chaotropic agent.

23. (Previously presented) The method of claim 22, wherein the chaotropic agent is guanidinium and the first wash solution further comprises alcohol.

24. (Previously presented) The method of claim 21, further comprising washing the solid support with a second wash solution after washing with the first wash solution.

25. (Previously presented) The method of claim 24, wherein the second wash solution comprises alcohol.

26. (Previously presented) The method of claim 1, wherein the small RNA molecules are eluted from the solid support at a temperature of about 60 °C to about 100 °C.

27. (Previously presented) The method of claim 1, wherein the small RNA molecules are eluted from the solid support with a low-ionic-strength solution.

28. (Previously presented) The method of claim 27, wherein the ionic solution comprises up to 10 mM salt.

29. (Previously presented) The method of claim 1, wherein the solid support is a mineral support or polymer support.

30. (Previously presented) The method of claim 29, wherein the mineral support or polymer support is a column comprising silica.

31. (Previously presented) The method of claim 29, wherein the mineral or polymer support is a set of beads made of an absorptive polymer.

32. (Previously presented) The method of claim 31, wherein the set of beads are collected by centrifugation, filtration, or magnetic capture.

33. (Previously presented) The method of claim 30, wherein the silica is glass fiber.

34. (Previously presented) The method of claim 1, further comprising passing the lysate through the column by centrifugation or gas pressure.

35. (Previously presented) The method of claim 1, further comprising capturing the eluted small RNA molecules.

36. (Previously presented) The method of claim 33, wherein the eluted small RNA molecules are captured on a filter and then collected.

37. (Previously presented) The method of claim 1, wherein the small RNA molecules are single stranded.

38. (Previously presented) The method of claim 1, wherein the small RNA molecules are double stranded.

39. (Previously presented) The method of claim 1, wherein the small RNA molecules have at most 100 nucleotides or fewer.

40. (Previously presented) The method of claim 39, wherein the small RNA molecules have at most 70 nucleotides or fewer.

41. (Previously presented) The method of claim 40, wherein the small RNA molecules have at most 30 nucleotides or fewer.

42. (Previously presented) A method for isolating miRNA or siRNA from a sample comprising:

a) obtaining a sample having miRNA or siRNA;
b) adding an alcohol solution to the sample to an alcohol concentration of about 35% to about 70%;
c) adding an extraction solution to the sample;

d) applying the sample to a mineral or polymer support; and

e) eluting the siRNA or miRNA from the mineral or polymer support to form eluted siRNA or miRNA.

43. (Original) The method of claim 42, wherein the sample is a cell lysate.

44. (Original) The method of claim 43, wherein the cell lysate is produced by adding a lysing solution comprising a chaotropic agent or detergent to cells having miRNA or siRNA.

45. (Previously presented) The method of claim 42, wherein the eluted siRNA or miRNA is enriched at least about 10-fold by mass for miRNA or siRNA.

46. (Currently amended) A method for isolating miRNA molecules from a sample containing miRNA molecules, comprising:

a) adding an alcohol solution to the sample to an alcohol concentration of about 35% to about 70%;

b) applying the sample to a mineral or polymer support;

c) eluting miRNA molecules from the support; and

d) using or characterizing the miRNA molecules.

47. (Original) The method of claim 46, wherein the sample is a cell lysate.

48. (Previously presented) A method for isolating small RNA molecules from a sample comprising:

a) lysing cells in the sample with a lysing solution comprising guanidinium, wherein a lysate with a concentration of at least about 1 M guanidinium is produced;

b) extracting small RNA molecules from the lysate with an extraction solution comprising phenol;

c) adding to the lysate an alcohol solution for form a lysate/alcohol mixture, wherein the concentration of alcohol in the mixture is between about 35% to about 70%;

d) applying the lysate/alcohol mixture to a mineral or polymer support;

e) eluting the small RNA molecules from the mineral or polymer support;

f) capturing the small RNA molecules; and

g) using the isolated small RNA molecules.

49. (Canceled)

50. (Currently amended) A method for isolating small RNA molecules from a sample comprising:

a) lysing cells in a lysing solution to produce a lysate;

b) extracting small RNA molecules from the lysate with an extraction solution comprising phenol;

c) adding to the lysate an alcohol solution to form a lysate/alcohol mixture of about 20% to about 35% alcohol;

d) applying the lysate/alcohol mixture to a first solid support;

e) collecting flow-through lysate/alcohol mixture;

f) adding to the flow-through lysate/alcohol mixture an alcohol solution to an alcohol concentration of about 35% to about 70%;

g) applying the lysate/alcohol mixture to a second solid support; and

h) eluting small RNA molecules from the solid support.

51. (Canceled)

52. (Canceled)

53. (Previously presented) The method of claim 50, further comprising using or characterizing the small RNA molecules.

54. (Previously presented) The method of claim 42, wherein elution is with an ionic solution.

55. (Previously presented) The method of claim 46, wherein elution is with an ionic solution.

56. (Previously presented) The method of claim 48, wherein elution is with an ionic solution.

57. (Previously presented) The method of claim 50, wherein elution is with an ionic solution.

58. (Previously presented) The method of claim 46, further comprising washing the mineral or polymer support with a first wash solution after applying the sample to the mineral or polymer support.

59. (Previously presented) The method of claim 58, wherein the first wash solution comprises a chaotropic agent.

60. (Previously presented) The method of claim 59, wherein the chaotropic agent comprises guanidinium and the first wash solution further comprises alcohol.

61. (Previously presented) The method of claim 59, further comprising washing the mineral or polymer support with a second wash solution.

62. (Previously presented) The method of claim 61, wherein the second wash solution comprises alcohol.

63. (Previously presented) The method of claim 60, wherein the guanidinium is in the form of guanidinium isocyanate, the first wash solution comprises ethanol at 70%, and the second wash solution comprises ethanol at 80%.

64. (Currently amended) A method for isolating small RNA molecules from a sample containing small RNA molecules, comprising:

a) adding an ethanol solution to the sample to result in an ethanol concentration of between about 35% to about 70%;
b) applying the sample to a mineral support;
c) eluting small RNA molecules from the support; and
d) using or characterizing the small RNA molecules.

65. (Previously presented) The method of claim 64, wherein the small RNA molecules comprise miRNA molecules.

66. (Previously presented) The method of claim 64, wherein the small RNA molecules comprise siRNA molecules.

67. (Previously presented) The method of claim 64, further comprising washing the mineral support with a first wash solution after applying the sample to the mineral support.

68. (Previously presented) The method of claim 67, wherein the first wash solution comprises a chaotropic agent.

69. (Previously presented) The method of claim 68, wherein the chaotropic agent comprises guanidinium and the first wash solution further comprises alcohol.

70. (Previously presented) The method of claim 69, further comprising washing the mineral support with a second wash solution.

71. (Previously presented) The method of claim 70, wherein the second wash solution comprises alcohol.

72. (Previously presented) The method of claim 70, wherein the guanidinium is in the form of guanidinium isocyanate at a concentration of 1.6 M, the first wash solution comprises ethanol at 70%, and the second wash solution comprises ethanol at 80%.